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1	BRS	221	358/498.ccls. and ((double adj sided) (front and back))	USPAT; USOCR; EPO; JPO
2	BRS	1	"4743974".pn.	USPAT; USOCR; EPO; JPO
3	BRS	79	("4261661" "4429333" "4475128" "4536077" "4562485" "4563706" "4571636").PN. OR ("4743974").URPN.	US-PGPUB; USPAT; USOCR

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to an image reader.

[0002]

[Description of the Prior Art] A 1st reading means to read a manuscript automatic feeding means and the front face of a sheet manuscript as this kind of an image reader conventionally, The sheet manuscript reading mode in which a sheet image is read while it has a 2nd reading means to read the rear face of this manuscript and the predetermined reading station on contact glass is made to feed with this manuscript, The thick manuscript of a book manuscript etc. is laid on contact glass, and what can choose the book mode in which image read is performed is used, moving the 1st reading means.

[0003] And in such an image reader, in sheet manuscript reading mode, after separating a sheet manuscript, conveying to a predetermined reading station and reading a front face, this manuscript is reversed and it conveys to a predetermined reading station again, after reading a rear face, paper is delivered, and double-sided read is performed. For this reason, the throughput of read is not made early and there are problems, like since the conveyance path is complicated, there is much possibility of giving a damage to a manuscript or making it damaging.

[0004]

[Problem(s) to be Solved by the Invention] Then, some which were indicated by JP,4-234258,A are one of those can solve such a problem, and this has two optical system, and it reads both sides to coincidence, conveying a manuscript. However, in addition to having two optical system, since such a thing has many components mark, its structure is complicated and attaches it, and in addition to a sex being inferior, it has the problem of being unable to consider as the thing of small size and becoming high cost.

[0005] Then, the purpose of this invention solve the problem which the above conventional image readers have, can do the throughput of read early, and be simple for a conveyance path and be to offer the image reader used as high cost, being able to give a damage to a manuscript or be use as the thing of small size in addition to there be little possibility of make it damage, and structure be easy, attach, and a sex be good.

[0006]

[Means for Solving the Problem] In order that this invention may attain the above purposes, invention according to claim 1 A sheet manuscript automatic feeding means and a 1st reading means to read the front face of a sheet manuscript, The sheet manuscript reading mode in which an image is read while it has a 2nd reading means to read the rear face of this manuscript and the predetermined reading station on contact glass is made to feed with a sheet manuscript, In the image reader which can choose the book mode in which image read is performed while laying thick manuscripts, such as a book manuscript, on contact glass and moving the 1st reading means The 2nd reading means is characterized by equipping the 1st reading tooth-back plate of the 1st reading means in one.

[0007] Invention according to claim 2 is characterized by equipping the body of equipment with the 1st

reading tooth-back plate removable, and equipping the body of equipment with the 1st reading tooth-back plate and the 2nd reading tooth-back plate with which it is not equipped with the reading means alternatively in invention according to claim 1.

[0008] Invention according to claim 3 is characterized by performing automatically insertion and detachment of the signal line to the 2nd reading means by attachment-and-detachment actuation to the body of equipment of the 1st reading tooth-back plate in invention according to claim 1 or 2.

[0009] Invention according to claim 4 is characterized by the spotting member of the thick manuscript on the contact glass in book mode serving as the 2nd reading tooth-back plate and the location conclusive factor stage of the height direction over the contact glass of the 2nd reading means in invention according to claim 1 to 3.

[0010]

[Embodiment of the Invention] In drawing 1 and the 1st operation gestalt of this invention shown in 2, in 1, the 1st reading means and 2 show a manuscript automatic feeding means, and 3 shows the 2nd reading means. The 1st transit object 11 which the 1st reading means 1 has the box-like reading base 4, forms the thick manuscript spotting member 7 in the top-face 1 side at the side the 1st contact glass 6 for thick manuscripts, and else, and becomes the interior from the lighting 8 of contraction optical system, and 1st mirror 9 grade, The 2nd transit object 14 which consists of the 2nd mirror 12 and 3rd mirror 13 grade, a lens 16 and the photo-electric-conversion means (CCD) 17, and the reading means constituted by the control board 18 grade are arranged. The 2nd contact glass 21 for sheet manuscript front faces and the 2nd tooth-back plate 22 for sheet manuscript rear faces are attached in the thick manuscript spotting member 7, and the heights 26 for forming the **** gap 24 between the 1st tooth-back plates 23 of the 1st reading means 1 which carries out a postscript are formed in it. The 2nd reading means 3 is the actual size sensor of an adhesion mold, and is constituted by the usual SELFOC lens which omitted illustration, a sensor, a substrate, the LED light source, etc.

[0011] By the motor which is not illustrated, it moves at the rate of 2:1, and the thick manuscript on the 1st contact glass 6 is scanned, image formation is carried out on CCD17, the image of a manuscript is changed into an electrical signal by a wire or a timing belt etc. which does not illustrate the 1st and 2 transit objects 11 and 14, respectively, and an image processing is carried out by the control board 18. You may be the approach of constituting contraction optical system by making lighting, two or more mirrors, a lens, and CCD17 into one unit in addition to this, and scanning the thick manuscript on the 1st contact glass 6 etc.

[0012] A feed means to consist of pickup koro 31 grades in which the manuscript automatic feeding means 2 conveys the both-sides plates 27 and 28, these both-sides plate 27, the manuscript tray 29 on which it was constructed across among 28, and a manuscript to the separation section in an order from a top, The separation means which consists of feed koro 32 and separation koro 33 grade, and a conveyance means to consist of a guide plate 34 and conveyance koro 36 grade, and to convey a manuscript to the 1st reading station A and the 2nd reading station B, It has a delivery means to deliver paper to the manuscript which a guide plate 37 and conveyance koro 38 grade were consisted of, and was read, and the paper output tray 39 which carries out the stack of the manuscript to which paper was delivered.

[0013] They are the feed sensor which the manuscript sensor by which 41 detects the existence of the manuscript on the manuscript tray 39, and 42 detect [sensor] that paper was fed to the manuscript, and makes the drive of said feed section and the separation section turn off, the reading sensor by which 43 detects reading timing, and the delivery sensor which checks that, as for 44, paper has been delivered to a manuscript. Although this operation gestalt is wound a top and serves as a feed method, it instead winds the bottom, and is good also as a feed method, and good also as a feed method to which paper is delivered as it is after reading without turning a rear face up, feeding paper and being reversed. Moreover, FRR, friction putt, etc. may be used instead of the feed koro 32 and separation koro 33 grade as a separation means.

[0014] As shown in drawing 2, the both-sides plates 27 and 28 of the manuscript automatic feeding means 2 are equipped with the 1st tooth-back plate 23 of the 1st reading means 1 removable by the

setscrew 46, and the connector 47 to the 2nd reading means 3 is attached in the side plate 27 by the side of one. The 2nd reading means 3 is attached in the location which counters the 2nd tooth-back plate 22 of the thick manuscript spotting member 7 of the 1st tooth-back plate 23, and 48 shows the 3rd contact glass for sheet manuscript rear faces.

[0015] In the above mentioned, convey a sheet manuscript with an ADF method and it faces reading both sides of that. If the start switch which is not illustrated is turned on, it will be detected by the manuscript sensor 41 that there is a manuscript on the manuscript tray 29 of a feed means. It is conveyed by the pickup koro 31 from an upper manuscript to the sequential separation section, and the feed koro 32 and the separation koro 33 dissociate one sheet at a time, and it is conveyed along with the guide plate 34 of a conveyance means. Thus, when only fixed distance is conveyed and this tip reaches the nip of the conveyance koro 36 after the feed sensor 42 detects the tip of a manuscript, the drive of the pickup koro 31 and the separation koro 33 will be severed, these will take, and it will carry out the surroundings. Thus, when the back end of a manuscript passes the feed sensor 42 and predetermined distance conveyance is carried out, the pickup koro 31 conveys the following manuscript, it winds that it is the same as that of the above until it detects that the manuscript sensor 41 of a manuscript was lost on the manuscript tray 29, and it is *****.

[0016] If the tip of the manuscript which is the above, and was made and conveyed is detected by the reading sensor 43 If it is detected that it was measured by counting the step of the pulse motor which does not illustrate the amount of conveyances, and the tip reached the 1st manuscript reading station A by it When having reached by the 2nd manuscript reading station B again is detected in the read of the front face of a manuscript by the 1st reading means 1, the 2nd reading means 3 will perform read of the rear face of a manuscript. Thus, if the back end of a manuscript detects by the reading sensor 43, the amount of conveyances will be measured by counting the step of a pulse motor like the above, and read will be ended if it reaches a predetermined value.

[0017] Thus, the stack of the manuscript which read ended is delivered [paper] to it and carried out to a paper output tray 39 by the delivery means which consisted of a guide plate 37 and conveyance koro 38 grade. Under the present circumstances, after detecting the back end of the manuscript to which paper was delivered by the delivery sensor 44, it checks that the manuscript has carried out the stack to the paper output tray 39 by carrying out predetermined distance conveyance, and the read of the sheet manuscript by the ADF method is completed. In the case of this double-sided manuscript read, the 1st tooth-back plate 23 with which the 2nd reading means 3 is attached will be supported by the heights 26 of the thick manuscript spotting member 7 as shown in drawing 2 , and the height direction over the contact glass of the 2nd reading means will be positioned.

[0018] The 3rd tooth-back plate 51 with which the 2nd reading means 3 is not established is used for the 2nd operation gestalt of this invention shown in drawing 3 instead of the 1st tooth-back plate 23 of the 1st operation gestalt. In order to do in this way, in drawing 2 , a setscrew 46 will be removed, the 1st tooth-back plate 23 will be demounted from side plates 27 and 28, and the 3rd tooth-back plate 51 will be instead attached in side plates 27 and 28 with a setscrew 46. Such a thing is used when it does not need double-sided read, and it can be easily changed by the easy actuation for either a double-sided reader or an one side reader by doing in this way and adopting the 1st tooth-back plate 23 or the 3rd tooth-back plate 51 if needed.

[0019] In both the aforementioned operation gestalt, in using a thick manuscript, although a thick manuscript will be similarly laid on the 1st contact glass 6 and the 1st reading means 1 will perform read also in the conventional thing, a thick manuscript will be positioned by the thick manuscript spotting member 7 in that case.

[0020]

[Effect of the Invention] This invention is above. Invention according to claim 1 A sheet manuscript automatic feeding means and a 1st reading means to read the front face of a sheet manuscript, The sheet manuscript reading mode in which an image is read while it has a 2nd reading means to read the rear face of this manuscript and the predetermined reading station on contact glass is made to feed with a sheet manuscript, In the image reader which can choose the book mode in which image read is

performed while laying thick manuscripts, such as a book manuscript, on contact glass and moving the 1st reading means. Since the 1st reading tooth-back plate of the 1st reading means is equipped with the 2nd reading means in one. The throughput of read is made early, and a conveyance path is easy and it is [a damage can be given to a manuscript or, in addition to there being little possibility of making it damaging, and structure being easy, attaching, and a sex being good, it can consider as the thing of small size, and] effective in not becoming expensive.

[0021] Since the body of equipment is equipped with the 1st reading tooth-back plate removable and the body of equipment is alternatively equipped with the 1st reading tooth-back plate and the 2nd reading tooth-back plate with which it is not equipped with the reading means in invention according to claim 1, invention according to claim 2 only preparing the 2nd reading tooth-back plate -- a user -- easy -- a double-sided manuscript reader -- an one side manuscript reader -- or it can carry out reversely [the] and, moreover, is effective in being cheap.

[0022] In invention according to claim 1 or 2, since insertion and detachment of the signal line to the 2nd reading means are automatically performed by the attachment-and-detachment actuation to the body of equipment of the 1st reading tooth-back plate, invention according to claim 3 is effective in the attachment and detachment to the body of a manuscript reader of the 2nd reading means being performed easily and efficiently.

[0023] In invention according to claim 1 to 3, since the spotting member of the thick manuscript on the contact glass in book mode serves as the location conclusive factor stage of the height direction over the 2nd reading tooth-back plate and the contact glass of the 2nd reading means, invention according to claim 4 is effective in the ability to perform differing with the same components, simplify structure, and consider as a cheap thing.

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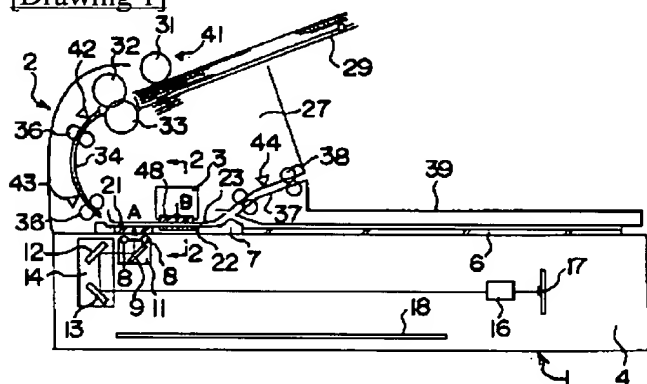
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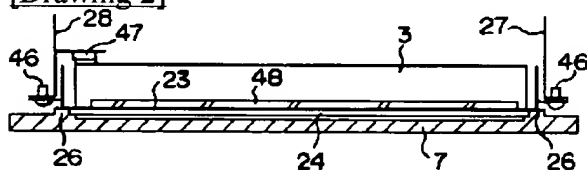
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DRAWINGS

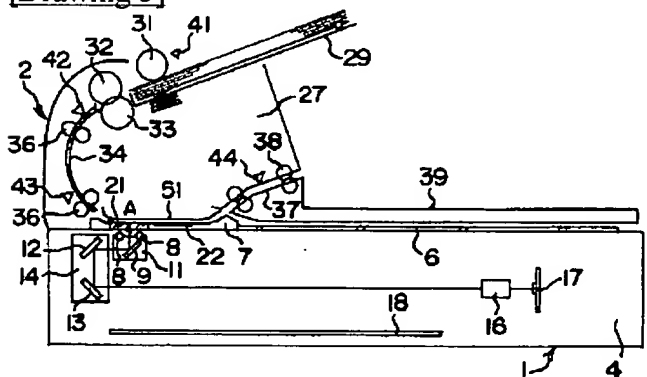
[Drawing 1]



[Drawing 2]



[Drawing 3]



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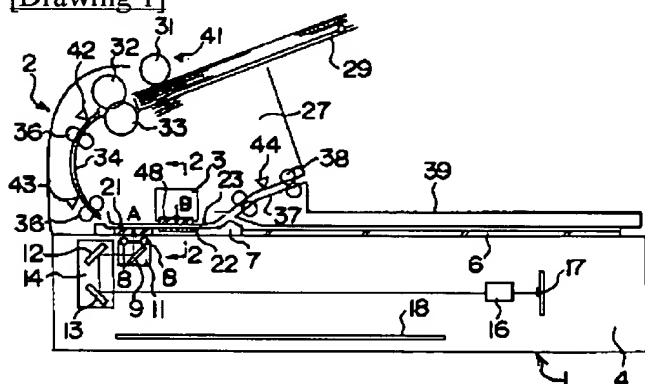
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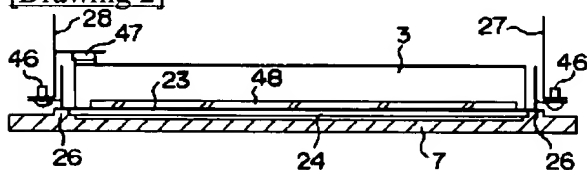
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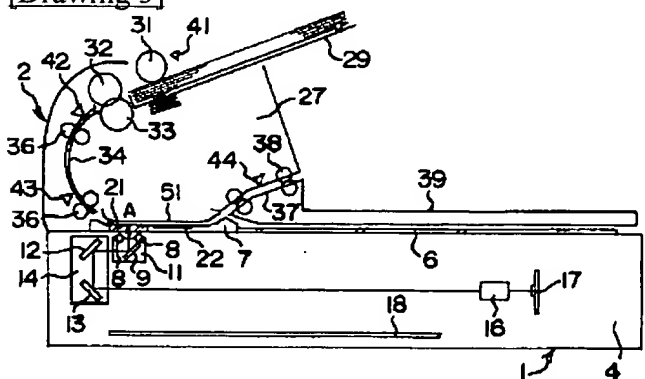
[Drawing 1]



[Drawing 2]



[Drawing 3]



[Translation done.]